Amendments to the Claims:

The following Listing of Claims replaces all prior versions and listings of the claims in this application.

Listing of the Claims

1. (Currently Amended) A biologically-functional, surface-immobilized multilayer structure, comprising a plurality of vesicles formed of a lipid bilayer membrane and sufficiently spaced apart from said surface, wherein a portion of the vesicles are directly attached to the structure by binding surface-immobilized linkers with vesicle-attached linkers and a portion of the vesicles are attached to the structure by binding vesicle-attached linkers to vesicle-attached linkers of other vesicles, so as to provide said structure with two or more vesicle layers, wherein the surface-immobilized linkers and the vesicle-attached linkers comprise oligonucleotides and binding of one linker to another linker is mediated through hybridisation of said linker oligonucleotides, and wherein at least a selected population of said vesicles comprise a biologically active compound which provides the structure with biological functionality.

2. – 4. (Cancelled).

5. (Previously Presented) A structure according to claim 1, wherein said vesicle-attached linkers are attached to said vesicles via at least one of a hydrophobic anchoring moiety comprised in said vesicle-attached linker and a covalent bond to said vesicle via a functionalised group comprised in said vesicle-attached linker.

6. (Withdrawn) A structure according to claim 1, wherein said vesicles are coated with an outer

shell comprising compounds selected from the group consisting of polyethylene glycol, S-layer proteins, peptides, metal clusters and polymers, or wherein vesicle lipids themselves are linked by polymerisation.

7. (Withdrawn) A structure according to claim 1, wherein the interior volume of said vesicles comprises compounds selected from the group consisting of ions, dyes, drugs, antibodies, enzymes and other proteins.

8. (Previously Presented) A structure according to claim 1, wherein said hybridisation of said oligonucleotides is essentially sequence specific.

9. (Withdrawn) A structure according to claim 1, adapted for release of said multilayer structure from said surface.

10. (Withdrawn) A structure according to claim 9, designed so that said release is triggered by an electrical potential, light, osmotic stress or incubation with a compound which stimulates said release.

11. (Withdrawn) A structure according to claim 1, wherein at least two vesicles are attached to each surface-immobilized linker.

12. (Cancelled).

13. (Withdrawn) A structure according to claim 11, wherein said surface-immobilized linker comprises at least one non-linker attached region with a biological functionality.

14. (Cancelled).

15. (Withdrawn) A structure according to claim 13, wherein said non-linker attached region is capable of specific binding with an analyte.

16. (Cancelled).

17. (Withdrawn) A structure according to claim 11, wherein said vesicle-attached linkers are attached to said vesicles via at least one of a hydrophobic anchoring moiety comprised in said linker, and a covalent bond to said vesicle via a functionalised group comprised in said linker.

18. (Withdrawn) A structure according to claim 11, wherein said vesicles are coated with an outer shell comprising compounds selected from the group consisting of polyethylene glycol, S-layer proteins, peptides, metal clusters and polymers, or wherein vesicle lipids themselves are linked by polymerisation.

19. (Withdrawn) A structure according to claim 11, wherein the interior volume of said vesicles comprises compounds selected from the group consisting of ions, dyes, drugs, antibodies, enzymes and other proteins.

20. (Withdrawn) A structure according to claim 11, wherein said hybridisation of said oligonucleotides is essentially sequence specific.

21. (Withdrawn) A structure according to claim 11, adapted for release of said multilayer structure from said surface.

22. (Withdrawn) A structure according to claim 21 designed so that said release is triggered by an electrical potential, light, osmotic stress or incubation with a compound, which stimulates said release.

23. – 32. (Cancelled).

33. (Withdrawn – Currently Amended) A method for producing a surface-immobilised multilayer structure according to claim 1, the method comprising the steps of: (i) providing a surface comprising at least one linker immobilised onto the surface, said surface-immobilised linker(s) being adapted and available for binding to at least one vesicle-attached linker; (ii) providing vesicles formed of a lipid bilayer membrane, each vesicle comprising at least one outwardly projecting linker attached thereto, said vesicle-attached linker being adapted and available for direct binding to a surface-immobilised linker or another vesicle-attached linker, (iii) incubating at least one of the vesicles with the surface under conditions promoting binding of the vesicle-attached linker(s) directly to the surface-immobilised linker(s), and incubating at least another of the vesicles with the surface under conditions promoting binding of the vesicle-attached linker(s) directly to vesicle-attached linker(s) already immobilised into the structure,

resulting in immobilisation of the vesicle(s) and the linker(s) attached thereto into the structure, and (iv) repeating the previous step until the desired amount of vesicles are immobilised into said structure.

34. (Withdrawn) A method according to claim 33, wherein said surface-immobilised linker comprises at least two sites for binding of vesicle-attached linkers.

35. (Cancelled).

36. (Withdrawn) A method according to claim 33, wherein said surface-immobilised linker comprises only one site for binding of vesicle-attached linkers.

37. (Withdrawn) A method according to claim 36, wherein each vesicle comprises at least two vesicle-attached linkers.

38. (Cancelled).

39. (Withdrawn) A method according to claim 33, wherein said vesicle-attached linkers are attached to said vesicles via at least one of a hydrophobic anchoring moiety comprised in the linker, and a covalent bond to said vesicle via a functionalised group comprised in the linker.

40. (Cancelled).

41. (Withdrawn) A method according to claim 33, wherein said vesicles are coated with an outer shell comprising of compounds selected from the group consisting of polyethylene glycol, S-layer proteins, peptides, metal clusters and polymers.

42. (Withdrawn) A method according to claim 33, wherein the interior volume of said vesicles comprises compounds selected from the group consisting of ions, dyes, drugs, antibodies, enzymes and other proteins.

43. (Withdrawn) A method according to claim 33, wherein said surface comprises several surface-immobilised vesicles, which serves as a binding matrix for said structure.

44. (Withdrawn) A method according to claim 33, wherein said incubation is performed under conditions promoting sequence specific hybridisation of said oligonucleotides.

45. (Withdrawn) A method according to claim 33, also comprising the step of releasing compounds from the vesicles.

46. (Withdrawn) A method according to claim 45, wherein said release is triggered by an applied electrical potential osmotic stress or incubation with a compound, which stimulates said release.

47. (Withdrawn) A method for producing a multilayer structure of a plurality of vesicles, comprising the method according to claim 33, followed by the step of releasing said multilayer

structure from said surface.

48. (Withdrawn) A method according to claim 47, wherein said release is triggered by an electrical potential, osmotic stress or incubation with a compound, which stimulates said release.

49. (Withdrawn) A biosensor, comprising a structure according to claim 1.

50. (Withdrawn) A biosensor, comprising a structure produced according to claim 33.

51. (Withdrawn) The biosensor according to claim 50, wherein the formation of said structure is monitored by said biosensor.

52. (Withdrawn) The biosensor according to claim 49, wherein said biosensor is an optical biosensor, and said structure is used for increasing the signal of said optical biosensor.

53. (Withdrawn) The biosensor according to claim 49, wherein said biosensor is a mechanical biosensor, and said structure increases a signal of said mechanical biosensor.

54. (Withdrawn) A method for specifically removing or extracting one or several compounds from a complex solution of compounds, comprising contacting the complex solution with a structure according to claim 1.

55. (Withdrawn) A method for sensing a release of compounds, comprising sensing a release of

compounds from the vesicles of a structure according to claim 1.

56. (Withdrawn) The method according to claim 55, wherein said release is triggered by an applied electrical potential, osmotic stress or incubation with a compound, which stimulates said release.

57. (Withdrawn) The method according to claim 55, wherein said release is used for specific or localised drug delivery.

58. (Withdrawn) The method according to claim 55, wherein said release is used as a biosensor.

59. (Withdrawn) The method according to claim 55, for simultaneous analysis of several compounds.

60. (Withdrawn) A method of imaging, comprising imaging with a structure according to claim 1.

61. (Withdrawn – Currently Amended) A kit of parts comprising chemical compositions appropriate for the production of a surface-immobilised multilayer structure of a plurality of vesicles according to claim 1, comprising linkers, vesicles formed of a lipid bilayer membrane, compounds for attaching said linkers to said vesicles, and compounds for immobilising said linkers to a surface.

62. (Withdrawn) A kit of parts according to claim 61, also comprising at least one of compounds for attaching biologically active compounds to said vesicles, and biologically active compounds.

63. (Previously Presented) A structure according to claim 1, wherein the vesicles comprise a biologically active compound selected from the group consisting of membrane proteins, antibodies, functionalized lipids, and coupled water-soluble proteins.

64. (Previously Presented) A structure according to claim 1, wherein the vesicles comprise biologically active membrane proteins.

65. (Previously Presented) A structure according to claim 1, wherein the vesicles comprise a biologically active compound selected from the group consisting of drugs, proteins, peptides, and oligonucleotides.